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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,504	10/17/2003	Chai-Mei Jimmy Yu	INSIG1.001AUS	1989

20995 7590 07/07/2008  
KNOBBE MARTENS OLSON & BEAR LLP  
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EXAMINER
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CHOI, FRANK I

ART UNIT	PAPER NUMBER
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1616

NOTIFICATION DATE	DELIVERY MODE
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07/07/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/688,504	<b>Applicant(s)</b> YU ET AL.	
	<b>Examiner</b> FRANK I. CHOI	<b>Art Unit</b> 1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 04 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-15,19-23,26-31,33 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-15,19-23,26-31,33 and 35-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/4/2007 has been entered.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3-15,19-23, 26-31,33,35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stathatos et al. in view of Yamada et al. (US Pat. 5,897,958), Ogawa et al. (US Pat. 6,106,955), Makita et al. (US Pat. 4,993,354), Brill. (US Pat. 3,017,282) and Brill (US Pat. 3,002,854).

Stathatos et al. discloses a method of preparing a nanocrystallite titanium dioxide thin film by a reverse micelle process using a titanium alkoxide, i.e. 0.2M of titanium isopropoxide, non-ionic surfactant, i.e. 0.2 M of Triton® X-100, water (0.4 M) and cyclohexane, where the substrate, glass, is coated by dipping, the coating is dried and then the organic components are burned out (pgs. 83-87).

Yamada et al. discloses that for convenience of handling the titanium oxide can be in the form of a mixture of titanium alkoxide and titanium acetylacetonate (Column 7, lines 29-56). It

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is disclosed that the titanium oxide containing film can be formed on various substrates, such as glasses and ceramics, by dipping, drying and heat-treating and that said film exhibits antibacterial activity (Column 8, lines 1-57). An example is disclosed in which prior to baking, the coating was dried at 120 degrees Celcius (Example 2).

Ogawa et al. discloses coating of stainless steel with a titanium oxide film process includes heat treatment at a temperature range of from 200 to 600 degrees Celcius at a time of 10 to 300 minutes (Column 8, lines 4-24, lines 38-53). It is disclosed that the titanium oxide film has antifungal and sterilizing functions and can be prepared by hydrolysis of metal alkoxide and a sol-gel method and dip coated (Column 6, lines 65-68, Column 7).

Makita et al. discloses dip coating of a substrate, such as ceramic, metal or glass, in a coating liquid containing titanium alkoxide which can be lowered from the substrate at constant rate, such as about 2 mm/sec or about 3 mm/sec, and the coating dried and than heated (Examples 1 and 2, Column 6, lines 1-8).

Brill ('282) discloses that addition of acetylacetone stabilizes alkyl titanate solutions and can redissolve or inhibit precipitation of alkyl titanate in water (Column 2, lines 43-54).

Brill ('854) discloses that the '282 patent was concerned with preparing more concentrated, aqueous solutions of the reaction of alkyl titanate and acetylacetone without undesirable precipitation by adjusting the pH by adding an acid (Column 2, lines 44-53). It is disclosed that concentrations of the reaction mixture below 5% it is possible to add the desired amount to water (Column 2, lines 53-55).

The prior art discloses a method of preparing a nanocrystallite titanium dioxide thin film by a reverse micelle process using a titanium alkoxide, i.e. 0.2M of titanium isopropoxide, non-

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ionic surfactant, i.e. 0.2 M of Triton® X-100, water (0.4 M) and cyclohexane, where the substrate, glass, is coated by dipping, the coating is dried and then the organic components are burned out. The difference between the prior art and the claimed invention is that the prior art does not expressly disclose using a 2,4-diketone, such as acetyl acetone, a specified withdrawal speed, a specified drying and calcining temperature and time, a substrate of stainless steel or method for killing bacteria and viruses. However, the prior art amply suggests the same as the prior art discloses that acetyl acetone will stabilize alkyl titanate solutions and controls the solubility of alkyl titanate in water, withdrawal speeds falling within the claimed ranges, drying and calcining temperatures and times overlapping or within the claimed ranges and that titanium oxide films have antimicrobial and sterilizing activity. Further, hydrolysis of titanium alkoxide is disclosed to be a process by which titanium dioxide films are formed. Since hydrolysis requires the interaction of the titanium alkoxide with water, one of ordinary skill in the art would expect that solubility of the titanium alkoxide in water would affect the rate of hydrolysis. As such, it would have been well within the skill of and one of ordinary skill in the art would have been motivated to modify the prior art as above with the expectation that addition of acetylacetone would stabilize the solution and by its affect on the solubility of the alkyl titanate in water would be effective in controlling hydrolysis of the titanium alkoxide; that the coated substrate would be effective against bacteria and viruses; that use of acetyl acetone would improve ease of handling titanium oxide; and that the withdrawal times and drying and calcining temperatures and times could be varied as desired, including within the claimed ranges, depending on coating thickness and coverage desired, substrate used and time necessary to dry the coating and for calcining the coating on the substrate.

The Examiner has duly considered the Applicant's arguments but them unpersuasive.

The Supreme Court in *KSR International Co. v. Teleflex Inc.*, held the following:

(1) the obviousness analysis need not seek out precise teachings directed to the subject matter of the challenged claim and can take into account the inferences and creative steps that one of ordinary skill in the art would employ;

(2) the obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents;

(3) it is error to look only the problem the patentee was trying to solve-any need or problem known in the filed of endeavor at the time of invention and addressed by the prior art can provide a reason for combining the elements in the manner claimed;

(4) it is error to assume that one of ordinary skill in the art in attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem-common sense teaches that familiar items may have obvious uses beyond their primary purposes, and in many cases one of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle (one of ordinary skill in the art is not automaton);

(5) it is error to assume that a patent claim cannot be proved obvious merely by showing that the combination of elements was "obvious to try". *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396, 1397 (U.S. 2007).

The Applicant argues that Yamada et al. neither teaches or suggests that a stabilizer consisting essentially of a 2,4-diketone can contro the rate of hydrolysis of titanium oxide.

However, the prior art disclose that the addition of acetylacetone allows the alkyl titanate (See

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claim 2 of the present application that defines titanium alkoxide to include 1-6 alkyl titanate) to remain in solution when in contact with water. As such, since hydrolysis of titanium alkoxide requires contact of the titanium alkoxide with water, one of ordinary skill in the art would expect that since acetyl acetone increases the solubility of alkyl titanate in water that the addition of acetyl acetone would not only stabilize the solution but also control the rate of hydrolysis of titanium alkoxide. As indicated, above there is no requirement that there be an express disclosure in the art of a motivation to modify and/or combine the prior art as claimed and the obviousness analysis need not seek out precise teachings directed to the subject matter of the challenged claim and can take into account the inferences and creative steps that one of ordinary skill in the art would employ.

The Applicant argues that one of ordinary skill in the art would not be motivated by Brill '282 to omit water soluble acid and use only a stabilizer consisting essentially of 2,4-diketone. However, the Applicant has provided no evidence that the phrase "consisting essentially of" excludes a water soluble acid. Further, Brill '854 discloses that the acid was added to adjust pH to avoid undesirable precipitation and that at amounts below 5% of the reaction mixture of alkyl titanate and acetylacetone can be added to water. As such, one of ordinary skill in the art would expect that an acid would not be necessary where the amount of reaction mixture is less than 5% of the aqueous solution and that amounts greater than 5% could be used without an acid where the amount of precipitation is not undesirable.

Therefore, the claimed invention, as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention has been collectively taught by the combined teachings of the references.

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*Conclusion*

A facsimile center has been established in Technology Center 1600. The hours of operation are Monday through Friday, 8:45 AM to 4:45 PM. The telecopier number for accessing the facsimile machine is 571-273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Choi whose telephone number is (571)272-0610. Examiner maintains a compressed schedule and may be reached Monday, Tuesday, Thursday, Friday, 6:00 am – 4:30 pm (EST).

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Johann R. Richter, can be reached at (571)272-0646. Additionally, Technology Center 1600's Receptionist and Customer Service can be reached at (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frank Choi  
Patent Examiner  
Technology Center 1600  
July 3, 2008

/Johann R. Richter/  
Supervisory Patent Examiner, Art Unit 1616